

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions and listings of claims in this application.

Listing of Claims:

Please cancel claims 16-20 without prejudice or disclaimer.

1. (Currently Amended) A method for controlling the diameter of carbon nanotubes grown by chemical vapor deposition (CVD) or by plasma enhanced chemical vapor deposition (PECVD) in the range of about 0.2 to about 100 nanometers comprising:
 - introducing a catalyst substrate into a CVD OR PECVD growth reactor;
 - increasing the growth reactor ~~chamber~~ temperature to a desired growth temperature;
 - flowing reactive gases including a carbon containing precursor; and
 - controlling the residence time of the carbon containing precursor in the reactor to control the diameter of the carbon nanotubes.
2. (Original) The method of claim 1 wherein the residence time of the carbon containing precursor in the reactor is controlled by establishing a controlled pressure in the reaction chamber and adjusting the gas flow rate of the carbon precursor.
3. (Original) The method of claim 1 wherein the residence time of the carbon containing precursor in the reactor is controlled by establishing controlled gas flow rates into the reactor and adjusting the pressure in the reactor.
4. (Original) The method of claim 1 wherein the residence time of the carbon containing precursor in the reactor is controlled by adjusting the gas flow rate and the growth pressure of the reactor.

5. (Original) The method according to any one of Claims 1, 2, 3 or 4 wherein the growth temperature is about 400 to about 1200°C.

6. (Currently Amended) The method according to any one of Claims 1, 2, 3 or 4 wherein the catalyst substrate contains transition metal particles.

7. (Currently Amended) The method according to Claim 6 wherein the catalyst comprises at least one member selected from the group consisting of Fe, Mo, Co, Ni, Ti, Cr, Ru, Mn, Re, Rh, Pd, V and or alloys thereof.

8. (Currently Amended) The method according to any one of Claims 1, 2, 3 and 4 wherein the catalyst substrate ~~particles~~ have a size about 0.2 nanometers to about 100 nanometers.

9. (Original) The method according to any one of Claims 1, 2, 3 and 4 wherein the carbon containing precursor comprises at least one member selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, carbonyls, halogenated hydrocarbons, silylated hydrocarbons, alcohols, ethers, aldehydes, ketones, acids, phenols, esters, amines, alkyl nitrile, thioethers, cyanates, nitroalkyl, alkyl nitrate, and mixtures thereof.

10. (Original) The method according to any one of Claims 1, 2, 3 or 4 wherein the carbon containing precursor comprises at least one member selected from the group consisting of methane, ethane, propane, butane, ethylene, acetylene, carbon monoxide and benzene.

11. (Original) The method according to any one of Claims 1, 2, 3 or 4 which comprises employing a carrier gas along with the carbon precursor.

12. (Original) The method of claim 11 wherein the carrier gas comprises at least one member selected from the group consisting of argon, nitrogen, helium, hydrogen and ammonium.

13. (Original) The method according to any one of Claims 1, 2, 3 or 4 wherein the flow rate or pressure or both is adjusted such that the residence time in the reactor can be varied from about 1 minute to about 20 minutes, to tune the CNT diameter.

14. (Original) The method according to any one of a Claims 1, 2, 3 or 4 wherein the flow rate or pressure or both is adjusted so that the residence time can be varied between about 1.2 minutes to about 10 minutes to tune the CNT diameter.

15. (Original) The method according to any one of claims 1, 2, 3 or 4 wherein the diameter of the carbon nanotubes is smaller than the particle size of the catalyst.

16-20 (Canceled)